WE CLAIM:

1. A method of estimating a time-to-collision (TTC) of a vehicle with an object comprising the step of:

(a) acquiring a plurality of images of the object at known time intervals between the times at which the images of the plurality of images are acquired; and

(b) determining the time-to-collision (TTC) solely from information derived from the images and the time intervals, wherein said determining the TTC is based on a relative velocity and relative acceleration between the vehicle and the object.

2. The method according to claim 1, further comprising the step of:

(c) determining the relative velocity from the images and using the relative velocity to determine TTC.

3. The method according to claim 1, wherein said (b) determining the time-to-collision (TTC) includes determining a change in scale of an image of at least a portion of the object and using the change in scale for determining a function of the relative velocity.

4. The method, according to claim 1, further comprising the step of:

(c) determining a function of the relative acceleration from the images and using said function of the relative acceleration to determine the TTC.

5. The method according to claim 4, wherein said (c) determining said function of the relative acceleration includes determining a time derivative of a function of the relative velocity.

6. The method according to claim 3, wherein said determining a change in scale includes determining a ratio between a dimension of the object in a first one of the images and the same dimension of the object in a second one of the images.

7. The method according to claim 6, wherein said determining a function of the relative velocity includes determining a function $Tv = [1/(S-1)]\Delta T$ where S is the ratio and $\Delta T$ is a time lapse between two images of the images.

8. The method according to claim 7, wherein a function of the relative acceleration is determined based on a time derivative T'v, of function Tv.

9. The method according to claim 8, wherein the TTC is determined responsive to a function of Tv and T'v.

10. The method according to claim 8, wherein TTC is determined responsive to the expression: $TTC(t) = [Tv/C)][1-(1+2C)]^{1/2}$, where $C = T'v+1$.

11. The method according to claim 1, further comprising the step of:

(c) determining whether the vehicle and the object are on a course that leads to a collision at the TTC.

12. A method according to claim 11, wherein said determining whether the vehicle and object are on a course that leads to a collision at the TTC includes:

(i) determining respective motions of at least two features of the object relative to the vehicle from the images; and

(ii) determining from the relative motions whether at TTC said at least two features straddle at least a part of the vehicle.

13. A system which performs the method steps of claim 1, for determining the time-to-collision (TTC) of the vehicle with the object, the system comprising:

(a) at least one camera mounted in the vehicle and adapted for said acquiring of the images; and

(b) a processor which determines the time-to-collision (TTC) solely from information derived from the images and the time intervals, based on the relative velocity and the relative acceleration between the vehicle and the object.

14. The system, according to claim 13 wherein the at least one camera is a single camera.

15. The system, according to claim 13 , further comprising:

(c) an alarm apparatus for alerting a driver of the vehicle to a possible collision with the object responsive to the TTC.

16. The system, according to claim 13, further comprising:

(c) an alarm apparatus which alerts, based on the TTC, at least one person outside of the vehicle to a possible collision of the vehicle with the object.

17. The system, according to claim 13, wherein the at least one camera images an environment in front of the vehicle.

18. The system, according to claim 13, wherein the at least one camera images an environment in back of the vehicle.

19. The system, according to claim 13, wherein the at least one camera images an environment to a side of the vehicle.

20. A method of determining whether a vehicle and an object are on a collision course, the method comprising the steps of:

(a) acquiring a plurality of images of the object from a position of the vehicle at each of a plurality of known times;

(b) determining, from the images, respective motions of at least two features of the object relative to the vehicle;

(c) determining from the images an estimate of a possible time to collision (TTC) of the vehicle and the object; and

(d) determining from the relative motions whether at the TTC, the at least two features straddle at least a part of the vehicle, whereby the vehicle and object are on a collision course.

21. The method according to claim 20, wherein said (b) determining respective motions of the at least two features includes determining lateral motion of the features relative to the vehicle.

22. The method according to claim 20, wherein said (d) determining includes extrapolating lateral locations of the at least two features at TTC from the respective motions at the known times of said acquiring.

23. A method according to claim 20, wherein said (c) determining includes determining

TTC solely from the images and time intervals between the known times of said acquiring of the images.

24. A system which performs the method steps of claim 20, for determining whether a vehicle and an object are on a collision course, the system comprising:

(a) at least one camera mounted in the vehicle and adapted for said acquiring of the images; and

(b) a processor which determines from the images, respective motions of at least two features of the object relative to the vehicle and from the images determines an estimate of a possible time to collision (TTC) of the vehicle and the object; and from the relative motions determines whether at the TTC, the first and second features straddle at least a part of the vehicle.